Young, O. P., T. C. Lockley and G. B. Edwards. 1989. Spiders of Washington County, Mississippi. J. Arachnol., 17:27-41.

SPIDERS OF WASHINGTON COUNTY, MISSISSIPPI

Orrey P. Young

Southern Field Crop Insect Management Laboratory
USDA-ARS, P.O. Box 346
Stoneville, Mississippi 38776 USA

Timothy C. Lockley

Imported Fire Ant Station
USDA-APHIS-PPQ
3505 25th Avenue
Gulfport, Mississippi 39501 USA

and

G. B. Edwards

Florida State Collection of Arthropods
Division of Plant Industry
Florida Dept. Agric. & Cons. Serv.
P.O. Box 1269
Gainesville, Florida 32602 USA

ABSTRACT

Over a seven-year period, approximately 35,000 spiders representing 26 families, 133 genera, and 234 species were captured in Washington County, Mississippi, by pitfall, sweepnet, vacuum, bag, and hand. Specimens were collected in 10 different habitat types and in four vegetational strata. Old-field habitats yielded the most species (152) and residential lawns the fewest (14). Considering all habitats sampled, the ground layer produced 111 species, the herbaceous strata 133, the shrub layer 49, and the tree strata 30 species. The sweepnet method of capture obtained 128 species, pitfall 95, hand 61, vacuum 53, and bagging 19 species. The largest number of species were obtained in spring and early summer (maximum of 125 in May), with the fewest in mid-winter (Jan. = 24). Twenty-one species were considered abundant, 51 common, 67 uncommon, and 95 rare. Additions to the state list of Dorris (1972) number 102 species, for a new state total of 364 species.

A comparison with the North American fauna and with other surveys indicates that Washington County is underrepresented both in cursorial forms active on the soil surface and web-spinning forms typical of undisturbed habitats. The high incidence of disturbed habitats associated with intensive agricultural activities in Washington County seems to have produced a depauperate spider fauna, but spider populations of certain species characteristic of disturbed habitats are of sufficiently high density and broad distribution to have a potential affect on crop insect pests.

INTRODUCTION

Stoneville, Mississippi is the site of the Delta Branch Experiment Station, Mississippi State University, and the Delta States Research Center, U.S. Department of Agriculture. For more than 50 years, scientists have been

observing, collecting, and experimenting with the arthropods associated with crops on site and in the surrounding Washington County. In the last 25 years, much of that effort has been directed toward the arthropods of cotton and adjacent habitats (e.g., Pfrimmer 1964; Stadelbacher 1981). Although spiders have been indicated as potentially important predators in cotton, they have usually not been identified to the genus or species level (e.g., Pfrimmer 1964; Smith and Stadelbacher 1978). Over the last 10 years, the improved status of spider taxonomy and a broad awareness of spiders as biological control agents has changed the research environment concerning field studies of spiders in agricultural situations (Riechert and Lockley 1984).

Beginning in 1981, field collections have attempted to delineate the structure and composition of spider populations in the Stoneville environs. Since 1984, we have focused on the spiders in habitats adjacent to cotton, particularly those species that could be determined to be predators of the tarnished plant bug, *Lygus lineolaris* (Palisot) (Heteroptera: Miridae). These have included *Oxyopes salticus* Hentz (Oxyopidae), *Phidippus audax* (Hentz) (Salticidae), and *Pisaurina mira* (Walckenaer) (Pisauridae) (Lockley and Young 1986a, b; Lockley et al. 1989; Welbourn and Young 1988; Young 1989a, b, c, d; Young and Lockley 1985, 1986, 1988, 1989a, b). The purpose of this report is to present the results of seven years of sampling for spiders in Washington County. These data are compared with other studies, and the potential role of this assemblage of spiders as agents for crop pest suppression is discussed.

METHODS AND MATERIALS

Washington County, Mississippi, is in the west-central portion of the state, adjacent to the Mississippi River, and in the approximate center of the Yazoo-Mississippi Delta. This delta began formation about 18,000 years ago at the end of the last ice age and is ideally suited for intensive agriculture (Fisk 1944). Deep alluvial deposits, a flat terrain, ample moisture, hot and humid summers, and mild winters combine to facilitate the growth of plants, and their associated arthropods. Washington County contains ca 200,000 ha, of which ca 122,000 ha (61%) are under cultivation in such crops as cotton, rice, milo, and soybean. Timbered areas comprise ca 44,000 ha (22%) and include several state and federal parks and wildlife refuges in addition to areas located outside the levees. There are 1,365 km of roads in the county which, assuming an average width of 12 m, occupy 18,000 ha (9%). The remaining 16,000 ha (8%) are composed of residential and business areas, lakes, waterways, standing water, and marshes (Gunn et al. 1980). This pattern of land use provides a high percentage of "disturbed" habitats. All crop fields are routinely plowed, cultivated, sprayed with herbicides and insecticides, and otherwise made inhospitable for arthropods. "Edge" habitats—edge of road, edge of ditch, edge of crop field, edge of forest island, edge of wet area, etc.—also are typically disturbed areas that are mowed, sprayed with herbicides, cultivated, or otherwise intruded upon at irregular intervals. These disturbed habitats, combined with residential and business lawns and gardens, probably comprise over 75% of the county area.

Beginning in 1981, systematic sampling of a variety of habitats, both disturbed and undisturbed, was conducted utilizing five collection methods (Table 1).

Table 1.—Sampling effort for spiders in Washington County, Mississippi, 1981-1987.

Habitat or host plant	Sampling period	Freq. of collect.	Method of coll.	No. of samples	No. of spiders
Soybeans	VII-IX-81	Weekly	Sweep	40	1816
Forest	VI-82-VI-83	Biweekly	Pit	25	227
Erigeron spp.	IV-IX-84	We	Swp	136	909
Forest	IV-VI-84	We	Pit	45	278
Old-field	V-XII-84	We	Vac	103	332
Pasture	VI-VIII-84	We	Vac	9	1800
Erigeron spp.	IV-IX-85	We	Swp	104	782
Cotton margins	II-XII-85	Bi	Vac	140	1867
Old-field	III-85-V-86	Bi	Pit	117	1674
Margins, pasture, old-field	X-85-X-86	Bi	Swp, Vac	487	8994
Erigeron spp.	III-IX-86	We	Swp	502	3471
Roadside grass	IV-VI-86	We	Vac	336	7459
Margin flowers	V-86-IV-87	Monthly	Swp	34	317
Spanish Moss	V-86-V-87	Mo	Bag	15	613
Forest margins	IX-XI-86	We	Swp	54	1393
Misc. habitats	1981-87	—	Hand	—	3109
Totals				2147	35041

Ground-dwelling spiders were sampled with several types of pitfall traps, some with covers and some with interception barriers. Vegetation above the soil surface was sampled with a dense muslin-mesh sweepnet, diameter 39 cm. A motorized suction device (D-vac®) with a 34 cm diameter opening and a nozzle speed of ca 100 km/h was used to sample all strata, as was the technique of capturing specimens by hand. Terminal portions of tree branches containing Spanish moss also were bagged and removed. Over the seven-year period, samples were obtained during every week of the year and every hour of the diel. Samples were brought into the laboratory and frozen at −20°C until they could be examined and then thawed, sorted, identified, counted, and recorded. Voucher specimens and unidentified material were stored in alcohol for later processing.

Representatives of every spider species were examined by G. B. Edwards, A. R. Brady, Hope College, Holland, Michigan, or D. B. Richman, New Mexico State University, Las Cruces, New Mexico. Voucher specimens are deposited at the Mississippi Entomological Museum, Miss. State University, Starkville, in the personal collection of T. C. Lockley, and in the Florida State Collection of Arthropods, Division of Plant Industry, Gainesville.

RESULTS AND DISCUSSION

Within-county comparisons.—At least 234 species of spiders in 133 genera and 26 families were identified from ca 35,000 specimens collected over a seven-year period (Appendix 1). This assemblage occurred primarily (203 spp.) in ecotonal areas such as the margins of roads, fields, forests, and water, and in early-successional habitats such as old-fields and pastures (Table 2). Old-field habitats, 2-5 years post-cultivation and abandonment, contained the highest diversity of spiders (152 spp.), but represented one of the rarest habitat-types in a county under intense agricultural management. Road and crop-field margins contained the second-highest diversity of spiders—98 spp.—and represented considerably

Table 2.—Number of spider species distributed among various parameters, Washington County, Mississippi.

Strata		Method of capture		Abundance	
Ground	111	Pitfall	95	Rare	95
Herb	133	Sweep	128	Uncommon	67
Shrub	49	Vacuum	53	Uncommon	51
Tree	30	Hand	61	Abundant	21
		Bag	19		

Habitat			
Forest	33	Lawn, resid	14
Transitional (T)	49	Building	17
Crop, Field	43	Spanish moss	17
Meadow, Grassland (M)	23		
Old-field (O)	152	Combine, M,R	101
Water margin (W)	16	Combine, T,O,W	169
Road, Field margin (R)	98	Combine, M,R,T,O,W	203

more acreage than old-fields. Cotton and soybean fields, though representing over 50% of the county surface area, contained only 43 species. Thus only 19% of the spider species available in the county for predation on crop pests actually occurred on crops. Fortunately for crop pest control, most local pests (e.g., *Anthonomus* spp., *Heliothis* spp., *Lygus* spp.) also occupy habitats adjacent to crops at some time in their life cycle. Because no spider species was found exclusively on crops, potentially as many as 234 species may prey on crop pests in these adjacent habitats.

The diversity of spiders obtained by our collection methods was low in the winter months, with a minimum of 24 species collected in January (Fig. 1). Spider populations dramatically increased in April, and by May 125 species were active. The number of species captured each month gradually declined through the summer and fall, with 62 species still active in October. Twenty-one species were considered "abundant" in the habitats in which they occurred (Table 2). These included 11 species that were abundant in cotton, as well as in adjacent habitats. Given the large amount of acreage devoted to cotton, these 11 species were probably the most abundant spiders in Washington County and may have a major impact on cotton insect pests. They were *Neoscona arabesca* (Walck.), *Tetragnatha laboriosa* Hentz, *Ceraticelus emertoni* (O. P.-Camb.), *Lycosa lenta* group, *Lycosa rabida* Walck., *Pardosa milvina* (Hentz), *Oxyopes salticus* Hentz, *Pisaurina mira* (Walck.), *Metaphidippus galathea* (Walck.), *Phidippus audax* (Hentz), and *P. clarus* Keys. Several of these species are important predators in Washington County on the tarnished plant bug, *Lygus lineolaris* (Young 1989a, b, c, d). They may also have an affect on the cotton bollworms, *Heliothis* spp. (Stadelbacher and Lockley 1983), and the sterile bollworm hybrids and braconid parasites currently under consideration as control agents of the bollworms. The most abundant spider species in forested areas were *Agelenopsis naevia* (Walck.) and *Gladicosa gulosa* (Walck.); in Spanish moss, *Methaphidippus tillandsiae* Kaston; in roadside and field margins, *Oxyopes salticus* and *Ceraticelus emertoni*; in old-fields, *Pardosa milvina, Schizocosa* spp., *Xysticus ferox* (Hentz), and *Tetragnatha laboriosa*; and on *Erigeron* spp. (Compositae), *Metaphidippus galathea* and *Misumenops asperatus* (Hentz).

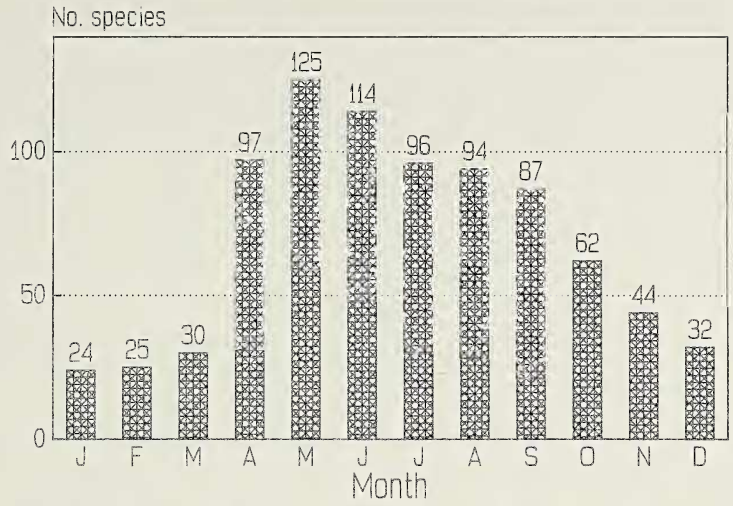

Figure 1.—Maximum number of spider species captured each month during 1981-1987 in Washington Co., Mississippi.

The sweepnet method of spider capture obtained 55% (128 spp.) of the fauna in Washington County (Table 2), and was the most frequently used capture technique. The vacuum method obtained the least number of species (53), but did produce five species not captured by other means. This collection technique probably could have been eliminated, with the resultant savings in time and effort more profitably directed toward other methods of collection.

The highly disturbed nature of most of the soil in Washington County suggests that typical soil spiders should be under-represented. Ground-dwelling spiders, obtained primarily by pitfall traps, represented 47% (111 spp.) of all species (Table 2), whereas foliage-dwelling spiders represented 70% of the species total (some species occupied both ground and foliage strata). For comparison, a three-year study conducted in frequently-disturbed soybean fields in Delaware indicated that 70% of the species occurred on foliage and only 32% occurred on the ground (Culin and Rust 1980). Conversely, a study that included sampling of deep leaf-litter in undisturbed Kansas woodland indicated that 75% of the species were ground-dwelling and 25% foliage-dwelling (Fitch 1963). Most of the forested area in Washington County is covered with water at some time each year, due either to flooding of the Mississippi River or to slow run-off after heavy rains. Leaf-litter depth is typically shallow or non-existent in these areas and, combined with the inundation, probably supports a very depauperate spider fauna (e.g., Uetz et al. 1979). Thus it is not surprising that, considering all habitats sampled, foliage-dwelling spiders are relatively very well-represented in Washington County.

Comparison with the North American fauna.—In 1985, V. D. Roth published a compilation of the families and genera of spiders known to occur in North America. He also included an estimate of the number of species in each genus. This information now permits a comparison of limited-area surveys with the entire North American fauna. In Washington County, specimens were obtained from 26 families and 133 genera (Table 3). This represents 54% of the 48 families and 28% of the 469 genera (Roth 1985) occurring in North America. The 234 species from Washington County represent only 7% of the 3311 North American

Table 3.—Proportion of genera and species of the North American spider fauna (Araneomorphae) that occur in Washington County, Mississippi.

	Genera			Species		
Family	N.A.	Wash. Co.	%	N.A.	Wash. Co.	%
Agelenidae	25	2	8	252	3	1
Amaurobiidae	8	—	—	82	—	—
Anapidae	1	—	—	1	—	—
Anyphaenidae	5	4	80	37	6	16
Aphantochilidae	1	—	—	1	—	—
Araneidae	42	23	55	192	39	20
Caponiidae	2	—	—	3	—	—
Clubionidae	20	8	32	193	13	7
Ctenidae	3	—	—	5	—	—
Desidae	1	—	—	1	—	—
Dictynidae	9	1	11	159	2	1
Diguetidae	1	—	—	6	—	—
Dinopidae	1	—	—	1	—	—
Dysderidae	3	1	33	7	1	14
Filistatidae	3	1	33	13	1	8
Gnaphosidae	24	12	50	248	25	10
Hahniidae	3	2	67	19	3	16
Hersiliidae	1	—	—	2	—	—
Homalonychidae	1	—	—	2	—	—
Hypochilidae	1	—	—	4	—	—
Leptonetidae	2	—	—	34	—	—
Linyphiidae	152	11	7	845	17	2
Loxoscelidae	1	1	100	13	2	15
Lycosidae	15	10	67	234	32	14
Mimetidae	2	1	50	13	1	8
Mysmenidae	3	—	—	6	—	—
Nesticidae	3	1	33	31	1	3
Ochyroceratidae	1	—	—	1	—	—
Oecobiidae	2	1	50	7	1	14
Oonopidae	8	1	13	24	1	4
Oxyopidae	3	2	67	20	2	10
Philodromidae	5	3	60	95	7	8
Pholcidae	10	3	30	31	3	10
Pisauridae	4	3	75	14	4	29
Plectreuridae	2	—	—	15	—	—
Salticidae	45	25	55	288	47	16
Scytodidae	1	1	100	9	1	11
Selenopidae	1	—	—	5	—	—
Sparassidae	3	—	—	8	—	—
Symphytognathidae	1	—	—	1	—	—
Telemidae	1	—	—	3	—	—
Tengellidae	1	—	—	5	—	—
Theridiidae	27	6	22	231	7	3
Theridiosomatidae	1	1	100	2	1	50
Thomisidae	10	7	70	128	11	9
Uloboridae	7	2	29	15	2	13
Zodariidae	2	—	—	4	—	—
Zoridae	1	—	—	1	—	—
Totals	469	133	28.4	3311	234	7.1

Table 4.—Comparison of spider guilds, North America and Washington County, Mississippi. Each family assigned to a guild based on data from Roth (1985), Kaston (1981), Gertsch (1979), and Comstock (1940).

	Web-spinning	%	Wandering	%
N.A. Fauna				
No. Families	25	52	23	48
No. Genera	307	65	162	35
No. Species	1955	59	1356	41
Wash. Co.				
No. Families	11	42	15	58
No. Genera	51	38	82	62
No. Species	78	33	156	67

species. There is little doubt that areas of similar size to Washington County that had a more diversified range of habitats would have substantially more species in a larger set of genera and families.

It is also possible to compare certain functional aspects of the North American and Washington County faunas. By the use of such sources as Roth (1985), Kaston (1981), Gertsch (1979), and Comstock (1940), each spider family can be designated as composed primarily of either web-spinning or wandering species. The North American fauna at the species level is thus estimated to be 59% web-spinners and 41% wanderers (Table 4). The Washington County fauna, however, is estimated to include 33% web-spinners and 67% wanderers. The considerable differences between these estimates probably are due to the preponderance of disturbed habitats in Washington County and to the negative effect of habitat disturbance (destruction, loss) on web-spinning spider populations.

Comparison with other faunal surveys.—Spider faunal surveys were reviewed to compare with our efforts in Washington County. Spider faunal lists can be classified in the following categories: a) specific plant association, e.g., peppermint (McIver and Belnavis 1986), daisy (Judd 1965); b) specific habitat, e.g., tree-bark (Bower and Snetsinger 1985), salt-marsh (LaSalle and Cruz 1985); c) general habitat type, e.g., old-field communities (Berry 1970), broomsedge communities (Barnes and Barnes 1955); d) multi-habitat natural area, e.g., Itasca St. Park (Heimer et al. 1984), Univ. Kansas Natur. Hist. Res. (Fitch 1963); e) restricted geographic area such as a town (Brown 1974) or island (Drew 1967); f) county (Dorris 1968); g) multi-county (Branson and Batch, 1970); h) state or providence, e.g., Wisconsin (Levi and Field 1954), British Columbia (West et al. 1984); i) multi-state, e.g., Georgia area (Chamberlin and Ivie 1944).

An examination of this literature showed few previous surveys in common with our county-wide study. The one survey that covered a single county was merely a checklist of the species, with no additional data (Dorris 1968). The 108 species in the Dorris study were collected in one year by sweepnet, sifting of litter, and hand-picking, all in unspecified habitats. Two multi-county studies, from northwest Iowa (Abraham 1987) and northern Kentucky (Branson and Batch 1970), were of limited comparative value. The Iowa study listed only the genera, but claimed 154 species. The Kentucky study listed 85 species, but was based on only 503 specimens obtained by limited collecting. An attempt to extract county data from state lists was not productive. Most state lists contained county records, but very little information on habitats, seasonality, abundance, or

sampling methods [e.g., Maryland (Muma 1945), Nebraska (Worley and Pickwell 1927), Oklahoma (Banks et al. 1932), Texas (Vogel 1970), Washington (Worley 1932)]. Kaston's *magnus opus* on the spiders of Connecticut (1981) is certainly an exception to that statement, but unfortunately his data are not in a format that allows ready comparison with other faunal surveys.

Perhaps the only studies remotely comparable to the Washington County data involve multi-habitat natural areas and restricted geographic areas. The Itasca State Park (Minnesota) study of Heimer et al. (1984) listed 124 species, but did not indicate the size of the area sampled, the amount of sampling effort through time, the number of specimens examined, or detailed habitat information. A study from the University of Oklahoma Biological Station (Branson 1966) listed 83 species identified from ca 1000 specimens collected during four summers, but did not indicate the area sampled, contained little ecological data or analysis, and was essentially a key to the genera of Oklahoma spiders. The most thorough study of a natural area was that of Fitch (1963) at the 300 ha University of Kansas Natural History Reservation. This study was conducted over a 13 year period utilizing most sampling techniques, during all months of the year, and in a variety of microhabitats within the tall-grass prairie and deciduous woodland habitats. Of the 192 species listed, 119 (62%) were considered to be characteristic of a deciduous forest habitat and 56 (29%) were associated with grasslands. Within the woodlands, 85 species (71%) were obtained from leaf-litter and 29 (24%) from arboreal situation. This compares with 47% of the Washington County species collected from the ground strata and 70% from above-ground sites (all habitats combined, some species occurring in several strata).

Several studies that involve restricted geographic areas may be appropriate for comparison. Brown (1974) reported 147 species of spiders collected over a six-month period from Nacogdoches, Texas, and vicinity. This check-list contained no information on the area sampled and no analysis, but did indicate that the families Salticidae (30 spp.) and Araneidae (29 spp.) represented most of the species. In Washington County, these two families also were highly represented (Salticidae—47 spp., Araneidae—39 spp.). Perhaps the most defined geographic area that has been examined for spiders is Beaver Island in Lake Michigan (Drew 1967). This 15,000 ha island is 24 km from the nearest mainland and has a well-documented flora and fauna. Spiders were collected day and night in a variety of habitats over a four-year period by sweepnet, sifting, beating, and hand. Of the 211 species obtained, 54% were web-spinners and 46% were wanderers. In Washington County, 33% of 234 species were web-spinners and 67% were wanderers. Web-spinners are characteristic of undisturbed sites containing adequate web supports (Duffey 1978), and their comparatively low incidence in Washington County could be due to the overwhelming predominance of disturbed habitats.

Comparison of various characteristics of the Washington County spider fauna with data from other faunal surveys has clearly indicated that the Washington County fauna is disproportionately well-represented by species typical of disturbed habitats. Some species, such as *Oxyopes salticus, Tetragnatha laboriosa*, and *Pardosa milvina*, may develop high population densities in habitats adjacent to crop fields. Crop insect pests occupying these habitats are probably exposed to considerable predation by spiders. Management of these habitats to conserve and enhance spiders and other predators could have a significant effect on crop pest populations.

ACKNOWLEDGMENTS

We appreciate the manuscript review provided by C. D. Dondale, M. J. Gaylor, D. T. Jennings, D. B. Richman and W. L. Sterling.

LITERATURE CITED

Abraham, B. J. 1987. Keys to the spiders of Northwestern Iowa. Proc. Iowa Acad. Sci., 94:37-50.

Banks, N., N. M. Newport and R. D. Bird. 1932. Oklahoma spiders. Publ. Univ. Oklahoma Biol. Surv., 4:7-49.

Barnes, R. D. and B. M. Barnes. 1955. The spider population of the abstract broomsedge community of the southeastern Piedmont. Ecology, 36:658-666.

Berry, J. W. 1970. Spiders of the North Carolina Piedmont old-field communities. J. Elisha Mitchell Sci. Soc., 86:97-105.

Bower, L. F. and R. Snetsinger. 1985. Tree bark as an overwintering niche for spiders (Araneae) in an oak-maple forest edge. Melsheimer Entomol. Ser., 35:1-5.

Branson, B. A. 1966. Spiders of the University of Oklahoma Biological Station, Marshall County, Oklahoma, with observations on species used by mud-daubers as larval food, and a review of the species known from Oklahoma. Southw. Natur., 11:338-371.

Branson, B. A. and D. L. Batch. 1970. Spiders (Arachnida: Araneida) from northern Kentucky, with notes on phalangids and some other localities. Trans. Kentucky Acad. Sci., 31:84-98.

Brown, K. M. 1974. A preliminary checklist of spiders of Nacogdoches, Texas. J. Arachnol., 1:229-240.

Chamberlin, R. V. and W. Ivie. 1944. Spiders of the Georgia region of North America. Bull. Univ. Utah, 35:1-267.

Comstock, J. H. 1940. The Spider Book (revised and edited by W. J. Gertsch). Cornell Univ. Press, Ithaca, New York.

Culin, J. D. and R. W. Rust. 1980. Comparison of the ground surface and foliage dwelling spider communities in a soybean habitat. Environ. Entomol., 9:577-582.

Dorris, P. R. 1968. A preliminary study of the spiders of Clark County Arkansas compared with a five year study of Mississippi spiders. Arkansas Acad. Sci. Proc., 22:33-37.

Dorris, P. R. 1972. A list of spiders collected in Mississippi. Notes Arachnol. Southwest, 3:1-4.

Drew, L. C. 1967. Spiders of Beaver Island, Michigan. Publ. Mus. Michigan St. Univ. Biol. Ser., 3:153-208.

Duffey, E. 1978. Ecological strategies in spiders including some characteristics of species in pioneer and mature habitats. Symp. Zool. Soc. London, 42:109-123.

Fisk, H. N. 1944. Geological Investigations of the Alluvial Valley of the Lower Mississippi River. Mississippi River Commission, Vicksburg.

Fitch, H. S. 1963. Spiders of the University of Kansas Natural History Reservation and Rockefeller Experimental Tract. Univ. Kansas Mus. Nat. Hist. Misc. Publ., 33:1-202.

Gertsch, W. J. 1979. American Spiders (2nd ed.). Van Nostrand Reinhold, New York.

Gunn, C. R., T. M. Pullen, E. A. Stadelbacher, J. M. Chandler and J. Barnes. 1980. Vascular Flora of Washington County, Mississippi, and Environs. USDA, SEA, AR(SR), 150 pp.

Heimer, S., W. Nentwig and B. Cutler. 1984. The spider fauna of the Itasca State Park (Minnesota, USA). Faun. Abh. Mus. Tierk. Dresden, 11:119-124.

Judd, W. W. 1965. Spiders and their insect prey from heads of ox-eye daisy, *Chrysanthemum leucanthemum* L., in southwestern Ontario. Proc. Entomol. Soc. Ontario, 95:137-139.

Kaston, B. J. 1981. Spiders of Connecticut (rev. ed.). Connecticut St. Geol. Nat. Hist. Surv. Bull., 70:1-1020.

LaSalle, M. W. and A. A. de la Cruz. 1985. Seasonal abundance and diversity of spiders in two intertidal marsh plant communities. Estuaries, 8:381-393.

Levi, H. W. and H. M. Field. 1954. The spiders of Wisconsin. American Midl. Natur., 51:440-467.

Lockley, T. C. and O. P. Young. 1986a. *Phidippus audax* (Araneae, Salticidae) predation upon a cicada (*Tibicen* sp.) (Homoptera, Cicadidae). J. Arachnol., 14:393-394.

Lockley, T. C. and O. P. Young. 1986b. Prey of the striped lynx spider, *Oxyopes salticus* (Araneae, Oxyopidae), on cotton in the Delta area of Mississippi. J. Arachnol., 14:395-397.

Lockley, T. C., O. P. Young and J. L. Hayes. 1989. Nocturnal predation by a crab spider, *Misumena vatia* (Araneae, Thomisidae). J. Arachnol. (submitted)

McIver, J. D. and D. L. Belnavis. 1986. A list of the spiders of peppermint in western and central Oregon. Proc. Entomol. Soc. Washington, 88:595-598.

Muma, M. H. 1945. An annotated list of the spiders of Maryland. Univ. Maryland Agric. Exp. Stn. Tech. Bull., A38:1-65.

Pfrimmer, T. R. 1964. Populations of certain insects and spiders on cotton plants following insecticide applications. J. Econ. Entomol., 57:640-644.

Riechert, S. E. and T. C. Lockley. 1984. Spiders as biological control agents. Annu. Rev. Entomol., 29:299-320.

Roth, V. D. 1985. Spider genera of North America. American Arachnol. Soc., 176 pp.

Smith, J. W. and E. A. Stadelbacher. 1978. Predatory arthropods: Seasonal rise and decline of populations in cotton fields in the Mississippi Delta. Environ. Entomol., 7:367-371.

Stadelbacher, E. A. 1981. Role of early-season wild and naturalized host plants in the buildup of the F1 generation of *Heliothis zea* and *H. virescens* in the Delta of Mississippi. Environ. Entomol., 10:766-770.

Stadelbacher, E. A. and T. C. Lockley. 1983. The spiders of *Geranium dissectum* Linneaus in Washington County, Mississippi. J. Georgia Entomol. Soc., 18:398-402.

Uetz, G. W., K. L. Van der Laan, G. F. Summers, P. A. K. Gibson and L. L. Getz. 1979. The effects of flooding on floodplain arthropod distribution, abundance and community structure. American Midl. Natur., 101:286-299.

Vogel, B. R. 1970. Bibliography of Texas spiders. Armadillo Papers, 2:1-36.

Welbourn, W. C. and O. P. Young. 1988. Mites parasitic on spiders, with a description of a new species of *Eutrombidium* (Acari, Eutrombidiidae). J. Arachnol., 16:373-385.

West, R., C. D. Dondale and R. A. Ring. 1984. A revised checklist of the spiders (Araneae) of British Columbia. J. Entomol. Soc. British Columbia, 81:80-98.

Worley, L. G. 1932. The spiders of Washington. Univ. Washington Publ. Biol., 1:1-63.

Worley, L. G. and G. B. Pickwell. 1927. The spiders of Nebraska. Univ. Nebraska Studies, 27:1-129.

Young, O. P. 1989a. Predators of the tarnished plant bug, *Lygus lineolaris* (Heteroptera: Miridae): Laboratory Evaluations. J. Entomol. Sci., 24:174-179.

Young, O. P. 1989b. Relationships between *Aster pilosus* (Compositae), *Misumenops* spp. (Araneae: Thomisidae), and *Lygus lineolaris* (Heteroptera: Miridae). J. Entomol. Sci., 24:250-255.

Young, O. P. 1989c. Field observations of predation by *Phidippus audax* (Araneae: Salticidae) on arthropods associated with cotton. J. Entomol. Sci., 24:264-271.

Young, O. P. 1989d. Predation by *Pisaurina Mira* (Araneae, Pisauridae) on *Lygus lineolaris* (Heteroptera, Miridae) and other arthropods. J. Arachnol. 17:43-48.

Young, O. P. and T. C. Lockley. 1985. The striped lynx spider, *Oxyopes salticus* (Araneae: Oxyopidae), in agroecosystems. Entomophaga, 30:329-346.

Young, O. P. and T. C. Lockley. 1986. Predation of striped lynx spider, *Oxyopes salticus* (Araneae: Oxyopidae), on tarnished plant bug, *Lygus lineolaris* (Heteroptera: Miridae): A laboratory evaluation. Ann. Entomol. Soc. America, 79:879-883.

Young, O. P. and T. C. Lockley. 1988. Dragonfly predation upon *Phidippus audax* (Araneae, Salticidae). J. Arachnol., 16:121-122.

Young, O. P. and T. C. Lockley. 1989a. Spiders of Spanish Moss in the Delta of Mississippi. J. Arachnol., 17: (in press)

Young, O. P. and T. C. Lockley. 1989b. Interactions between the predators *Phidippus audax* (Araneae: Salticidae) and *Hippodamia convergens* (Coleoptera: Coccinellidae) in cotton and in the laboratory. Entomol. News, 100:43-47.

Manuscript received June 1988, revised August 1988.

APPENDIX

SPIDERS OF WASHINGTON COUNTY, MISSISSIPPI, 1981-87.

Explanation of symbols.—*Month Collected:* Each month is designated by its first letter and is listed in chronological sequence. A dash between letters indicates that all intervening months not listed contained specimens of that species. A blank space between letters indicates that no specimens were found in the unlisted months. When certain months are listed alone, a second letter is added to avoid confusion: Ja = January, Je = June, Jy = July, Mr = March, My = May, Ap = April, Au = August.

Habitat: F = forest, T = transitional area between forest and field or road, C = crop field, M = meadow or grassland, O = old-field in early successional state 2-5 years after plowing, W = water margin such as edge of pond, stream, or drainage ditch, R = road or field margin, L = lawn in residential area, B = building, S = spanish moss hanging from trees 2-5 m above ground.

Strata: G = ground, H = herbs and grass 0.5-2.0 m above ground, S = shrubs 1-4 m above ground, T = tree 3-5 m above ground.

Abundance (Ab): A = abundant, C = common, U = uncommon, R = rare. Each species was assigned an abundance designation after a review of all collection records from the seven-year period and, although quite subjective, is our best estimate in the absence of quantitative data.

Capture method: P = pitfall trap, S = sweepnet, V = vacuum device, H = hand.

State Record (St Rc): Asterisk indicates addition to state list of Dorris (1972).

Taxon	Month coll.	Habitat	Strata	Ab	Capture	St Rc
AGELENIDAE						
Agelenopsis naevia (Walck.)	JJASO	TMOR	GHS	A	SVH	
Agelenopsis utahana (Chamb. & Ivie)	Jy	O	H	R	P	*
Coras medicinalis (Hentz)	Ja D	OR	G	C	PV	
ANYPHAENIDAE						
Anyphaena celer (Hentz)	JFMA SOND	FO	GH	U	PV	
Anyphaena maculata (Banks)	FMAM SOND	S	T	A	HB	*
Anyphaena sp. A	My	OR	H	R	PS	
Aysha gracilis (Hentz)	My	R	H	R	S	
Teudis mordax (O.P.-Cambridge)	MJ	R	H	R	SB	*
Wulfila sp.	AM S	O	GH	R	SV	*
ARANEIDAE						
Acacesia hamata (Hentz)	Au	O	S	R	S	*
Acanthepeira stellata (Walck.)	M JJASON	FTORC	HST	C	SVH	
Alpaida calix (Walck.)	MJ	O	H	R	V	
Araneus cingulatus (Walck.)	Jy	O	H	R	V	*
Araneus marmoreus Clerck	S	T	T	U	H	
Araneus miniatus (Walck.)	Je S	T	S	U	H	
Araneus pratensis (Emerton)	Au	T	T	U	H	
Araneus sp. A	Jy	TC	H	R	S	
Argiope aurantia Lucas	ASON	TCOR	HST	C	SH	
Argiope trifasciata (Forskål)	AS	O	H	R	H	
Colphepeira catawba (Banks)	J—D	O	H	U	SV	*
Cyclosa conica (Pallas)	Je	R	H	R	S	
Cyclosa turbinata (Walck.)	My	R	H	R	S	
Eustala cepina (Walck.)	Ja AM	OSM	HT	R	VB	*
Eustala sp. A	My	O	H	R	S	*
Gasteracantha cancriformis (L.)	Ja JASOND	TO	ST	C	SH	
Gea heptagon (Hentz)	AMJJA	CMOR	GH	C	SV	*
Glenognatha foxi (McCook)	AMJJAS	CMORL	GH	C	PSV	*
Hypsosinga sp.	Ap	O	H	R	S	*
Leucauge venusta (Walck.)	MJJ	FTCR	HS	C	SH	
Mangora sp.	O	O	H	R	S	
Mastophora phrynosoma Gertsch	O	T	T	R	H	*
Metazygia wittfeldae (McCook)	Je	R	H	R	S	*
Micrathena gracilis (Walck.)	JJ	F	ST	C	H	

Micrathena mitrata (Hentz)	Jy	F	ST	U	H	*
Micrathena sagittata (Walck.)	Jy	F	ST	U	H	
Neoscona arabesca (Walck.)	MJJAS	CMORW	HS	A	SVH	
Neoscona domiciliorum (Hentz)	My J	TCRS	HST	U	SB	
Neoscona hentzii (Keys.)	AS	TCWRS	HST	C	SB	*
Neoscona nautica (L. Koch)	SO	T	T	U	H	*
Neoscona pratensis (Hentz)	AS	TC	T	U	S	*
Nuctenea sp.	O	O	H	R	S	*
Pachygnatha sp.	A JJA	CO	GH	C	PS	
Tetragnatha elongata Walck.	AMJJAS	COR	HS	C	SV	*
Tetragnatha laboriosa Hentz	AMJJASO	TCOWR	HS	A	SVH	
Tetragnatha straminea Emerton	AMJJAS	COWR	HS	U	SV	
Tetragnatha versicolor Walck.	AMJJASO	TCOR	HS	C	SV	
Verrucosa arenata (Walck.)	Au	F	ST	U	H	
Wixia sp.	AM J	COR	H	R	SV	
ATYPIDAE						
Sphodros bicolor (Lucas)	A Je	F	G	R	P	*
CLUBIONIDAE						
Agroeca pratensis Emerton	Jy	L	G	R	P	
Castianeira gertschi Kaston	S	O	GH	R	SV	
Castianeira longipalpus (Hentz)	Ap N	O	GH	U	SV	
Chiracanthium inclusum (Hentz)	JJA	CO	H	R	S	
Clubiona abbotii L. Koch	AMJ ON	O	H	C	SV	
Clubiona obesa Hentz	AMJ	O	H	U	SV	
Clubionoides sp.	F AMJJAS	TCRS	HT	U	SB	*
Phrurotimpus sp.	A J AS	FOR	GH	C	PV	*
Scotinella sp.	Je	R	H	R	S	*
Trachelas deceptus (Banks)	JA	B	G	C	H	*
Trachelas similis F.O.P.-Cambridge	Jy	R	H	R	S	*
Trachelas tranquillus (Hentz)	Au	O	G	R	P	
Trachelas sp. A	Jy	R	H	U	S	
DICTYNIDAE						
Dictyna hentzi Kaston	AMJ	OR	GH	U	PSV	*
Dictyna sp. A	AM	OR	GH	U	PSV	
DYSDERIDAE						
Dysdera crocata C. L. Koch	Ap	F	G	R	P	
FILISTATIDAE						
Filistata hibernalis Hentz	J—N	B	G	C	H	
GNAPHOSIDAE						
Callilepis imbecilla Keys.	My S	OR	H	U	PS	
Cesonia bilineata (Keys.)	Ap	S	T	R	B	
Drassodes gosiutus Chamb.	Au	O	G	R	P	*
Drassyllus aprilinus (Banks)	My	O	G	R	P	*
Drassyllus covensis Exline	My	O	G	R	P	*
Drassyllus creolus Chamb. & Gertsch	My	O	G	R	P	*
Drassyllus dixinus Chamb.	My	O	G	R	P	*
Drassyllus ellipes Chamb. & Gertsch	Je	O	G	R	P	*
Drassyllus gynosaphes Chamb.	AMJ A	FTO	G	C	P	*
Drassyllus lepidus (Banks)	Jy	O	G	R	P	*
Drassyllus novus (Banks)	My	O	G	R	P	*
Gnaphosa fontinalis Keys.	JJA	OR	GH	C	PS	*
Gnaphosa sericata (L. Koch)	Au	O	G	U	P	
Haplodrassus signifer (C. L. Koch)	My	R	H	R	S	
Herpyllus ecclesiasticus Hentz	AM A O	B	G	C	H	*
Micaria delicatula Bryant	AM ON	FO	GH	U	PV	*
Nodocion floridanus (Banks)	MAMJ D	S	T	C	B	*
Sergiolus capulatus (Walck.)	Je	O	G	R	P	*
Sergiolus minutus (Banks)	My	O	G	R	P	*
Sergiolus ocellatus (Walck.)	Je O	O	G	U	PV	*

Urozelotes rusticus (L. Koch)	Ap	O	G	R	P	*
Zelotes aiken Platnick & Shadab	My	T	G	R	P	*
Zelotes duplex Chamb.	AM	TO	G	U	P	*
Zelotes hentzi Barrows	MAM	OR	GH	U	PS	
Zelotes laccus (Barrows)	AM	R	G	C	P	*
HAHNIIDAE						
Hahnia cinerea Emerton	J MAM D	FO	G	C	PV	*
Hahnia flaviceps Emerton	AM	O	G	R	P	*
Neoantistea agilis (Keys.)	N	O	G	U	V	*
LINYPHIIDAE						
Ceraticelus emertoni (O.P.-Camb.)	J—D	TCMORL	GH	A	PSVB	*
Ceraticelus sp. A	My	O	G	U	P	
Eperigone sp. A	AM	R	G	U	P	*
Eperigone sp. B	AM	R	G	U	P	
Eperigone sp. C	Ap	R	G	R	P	
Erigone sp. A	AM	R	G	U	P	*
Erigone sp. B	My	R	G	R	P	
Floricomus sp. A	AM	R	G	U	P	*
Floricomus sp. B	Ap	R	G	R	P	
Florinda sp.	AM	R	GH	U	PS	*
Frontinella pyramitela (Walck.)	J M Je D	O	H	C	S	
Grammonota sp. A	AM	R	GH	C	PS	*
Grammonota sp. B	Ap	R	G	R	P	
Linyphia sp.	AMJ	OR	H	U	S	
Meioneta sp.	AM	R	G	R	P	*
Neriene radiata (Walck.)	JJA	COR	H	C	SV	
Pityohyphantes sp.	My	R	G	R	P	*
LOXOSCELIDAE						
Loxosceles reclusa Gert. & Mul.	J JJA ON	B	G	U	H	
Loxosceles rufescens (Dufour)	F AS	B	G	R	H	*
LYCOSIDAE						
Allocosa absoluta (Gertsch)	AMJ	R	G	C	P	*
Allocosa funerea (Hentz)	F AMJJ	ORL	G	C	P	
Allocosa sp. A	Ap	R	G	R	P	
Arctosa littoralis (Hentz)	Je A	OR	G	U	PS	
Gladicosa bellamyi (Gert. & Wall.)	AMJJA	T	G	C	P	*
Gladicosa gulosa (Walck.)	J—N	FTO	G	A	PH	*
Gladicosa pulchra (Keys.)	JFMA S ND	FL	G	R	P	*
Lycosa acompa Chamberlin	FM MJ N	OL	G	C	PH	*
Lycosa annexa Chamb. & Ivie	J-J A-D	FTORLB	G	A	PH	*
Lycosa aspersa Hentz	MJ	TO	G	R	P	
Lycosa antelucana Montgomery	A J A	OL	H	R	PH	
Lycosa baltimoriana (Keys.)	S	O	G	R	P	
Lycosa carolinensis Walck.	O	O	G	R	P	
Lycosa georgicola Walck.	J AMJJASON	FTO	G	U	PH	*
Lycosa helluo Walck.	MJJ	FT	G	C	PH	
Lycosa helluo group	MJJAS	CR	GH	C	H	
Lycosa lenta (Hentz)	J—D	COR	G	C	PH	
Lycosa lenta group	MJJAS	CR	GH	A	H	
Lycosa punctulata Hentz	AM SON	TRO	GH	U	PH	
Lycosa rabida Walck.	MJJAS N	CMORL	HS	A	SH	
Pardosa atlantica Emerton	AM	R	GH	U	PS	*
Pardosa milvina (Hentz)	J—D	FTCMOWRL	GHS	A	PSVH	
Pardosa saxatilis (Hentz)	MJ A	MOR	GH	C	PS	
Pirata insularis Emerton	AMJJA	MOR	GH	C	PS	
Pirata minutus Emerton	J AMJ N	OR	GH	U	PSV	*
Pirata sp. A	JJ	O	G	R	P	
Schizocosa avida (Walck.)	AMJJASOND	FTMORL	GH	A	PVH	
Schizocosa humilis (Banks)	S	O	G	R	P	*

Schizocosa ocreata (Hentz)	AMJJASOND	FTOL	GH	C	PH	
Sosippus mimus Chamb.	F	F	G	R	H	*
Trabeops aurantiaca (Emerton)	F AMJJAS	FTOR	GH	U	PS	*
Trochosa avara Keys.	F—D	FTO	G	U	PS	
MIMETIDAE						
Mimetus sp.	Ap D	RS	T	R	HB	
NESTICIDAE						
Nesticus sp.	MJ	O	H	R	P	*
OECOBIIDAE						
Oecobius sp.	My JA	B	G	R	H	*
OONOPIDAE						
Orchestina saltitans Banks	MJ	B	G	R	H	*
OXYOPIDAE						
Oxyopes salticus Hentz	AMJJASON	TCMOWRL	HS	A	PSVH	
Peucetia viridans (Hentz)	Jy	F	S	R	S	
PHILODROMIDAE						
Ebo latithorax Keys.	MAMJ AS ND	FTOR	H	U	SV	
Philodromus keyserlingi Marx	AM	O	G	R	VB	*
Philodromus marxi Keys.	AMJJASO	TORS	GHST	C	PSV	*
Philodromus placidus Banks	MJ	T	S	R	S	*
Philodromus vulgaris (Hentz)	My	S	T	R	B	*
Tibellus duttoni (Hentz)	AMJJAS	TOR	HS	A	SVH	*
Tibellus oblongus (Walck.)	Jy	R	H	R	S	
PHOLCIDAE						
Pholcus phalangioides (Fues.)	J—D	B		C	H	
Psilochorus sp.	Jy	CR	H	R	S	*
Spermophora meridionalis Hentz	AM	B		R	H	
PISAURIDAE						
Dolomedes triton (Walck.)	MAMJJASON	TMOWR	GH	A	PSVH	
Pisaurina mira (Walck.)	AMJJA ON	TCOWRL	GHS	A	PSVH	
Pisaurina undulata (Keys.)	J—D	FMOR	HS	A	SVH	
Tinus peregrinus (Bishop)	O	O	H	R	S	
SALTICIDAE						
Agassa cyanea (Hentz)	Mr—D	TMOR	GH	C	PSV	
Ballus cinctipes (Banks)	Je	O	H	R	S	*
Ballus sp. A	AS	OW	H	R	SV	
Corythalia canosa (Walck.)	Je	B		R	H	*
Corythalia latipes C. L. Koch	Ap	O	G	R	P	*
Eris aurantia (Lucas)	Jy	O	HS	U	S	
Eris militaris (Hentz)	M MJJASO	TCMORS	HST	C	SB	
Euophrys sp.	Jy	O	H	R	S	*
Evarcha hoyi (Peckhams)	AMJJASO	OR	H	C	SV	
Habrocestum pulex (Hentz)	Je S	FO	GH	U	PS	
Habronattus agilis (Banks)	MJJASO	MOR	HS	C	PSV	
Habronattus calcaratus (Banks)	Jy	O	S	R	S	*
Habronattus coecatus (Hentz)	AMJJASO	MOWR	GH	A	PSV	
Habronattus decorus (Blackwall)	Au	CW	H	U	H	
Hentzia mitrata (Hentz)	JF Au	RS	HT	R	SB	
Hentzia palmarum (Hentz)	JJ	CR	H	U	S	
Maevia inclemens (Walck.)	MJ S	OWB	H	C	SH	
Marpissa bina (Hentz)	Je	O	HS	U	S	
Marpissa formosa (Banks)	AM	O	H	U	S	*
Marpissa lineata (C. L. Koch)	Mr	O	H	R	S	*
Marpissa pikei Peckhams	S	O	H	U	S	
Metacyrba taeniola (Hentz)	A JJ	O	HS	U	HS	
Metaphidippus galathea (Walck.)	F Ap—N	TCMOWR	HS	A	S	
Metaphidippus protervus (Walck.)	AMJJASO	OR	HS	C	S	
Metaphidippus tillandsiae Kaston	JFMAM OND	S	T	C	B	*
Neon nellii Peckhams	ASO	TOR	H	R	S	

Neonella vinnula Gertsch	Au	R	H	R	S	*
Phidippus audax (Hentz)	Ap—D	COW	HST	A	SH	
Phidippus clarus Keys.	MJJASON	CO	HS	A	SH	
Phidippus insignarius C. L. Koch	S	O	HS	U	S	*
Phidippus otiosus (Hentz)	MJ S	O	S	R	S	
Phidippus princeps Peckhams	Jy	O	S	R	S	
Phidippus purpuratus Keys.	Je	O	S	U	S	
Phidippus putnami (Peckhams)	S D	S	T	R	B	*
Phlegra fasciata (Hahn)	Au	O	S	R	S	
Platycryptus undatus (DeGeer)	JJAS	WBS	HT	U	SHB	
Plexippus paykulli (Audouin)	SO	O	H	R	S	*
Sarinda sp.	Jy	O	H	R	S	*
Sassacus papenhoei Peckhams	N	O	H	R	S	
Sitticus cursor Barrows	AMJ	O	HS	R	S	*
Thiodina puerpera (Hentz)	MJ O	FO	H	C	S	
Thiodina sylvana (Hentz)	MJJASO	CO	HS	U	S	
Tutelina elegans (Hentz)	JJASO	CO	HS	U	S	
Tutelina similis (Banks)	My	R	H	U	S	*
Zygoballus nervosus (Peckhams)	My D	OS	HT	U	HB	
Zygoballus rufipes Peckhams	AMJJ SOND	MO	GHS	C	SV	*
Zygoballus sexpunctatus (Hentz)	AMJ ASO D	OW	GH	U	V	
SCYTODIDAE						
Scytodes thoracica (Latr.)	J—D	B	G	U	H	
THERIDIIDAE						
Achaearanea globosa (Hentz)	JJ SO	B	G	R	H	*
Achaearanea tepidariorum (C. L. Koch)	J—D	B	G	A	H	
Euryopis funebris (Hentz)	My	S	T	R	B	
Latrodectus mactans (F.)	J—D	CMOB	GH	U	H	
Steatoda sp.	JJA	OR	H	U	S	*
Theridion frondeum Hentz	MJJASO	TMOR	GH	U	PSV	
Theridula opulenta (Walck.)	MJJAS	MOR	GH	U	PSV	*
THERIDIOSOMATIDAE						
Theridiosoma gemmosum (L. Koch)	Mr AS D	COR	GH	R	PSV	
THOMISIDAE						
Coriarachne sp.	AM	OR	H	R	SV	
Misumena vatia (Clerck)	MJJAS	TCOR	HS	C	SH	
Misumenoides formosipes (Walck.)	JJASON	TCOR	HS	C	SH	
Misumenops asperatus (Hentz)	JJAS	TCOR	HS	U	S	
Misumenops celer (Hentz)	JJA	COR	H	U	S	
Misumenops oblongus (Keys.)	MJJ S	OR	H	U	S	*
Oxyptila monroensis Keys.	AMJ OND	FO	G	C	PS	*
Synaema parvula (Hentz)	JA	CO	H	U	S	
Xysticus ferox (Hentz)	AMJJAS	FOR	GH	C	PS	
Xysticus fraternus Banks)	AMJJAS	FO	G	C	PS	*
Xysticus triguttatus Keys.	Je	F	G	R	P	
ULOBORIDAE						
Uloborus sp.	MA JJAS	TO	HS	U	SV	
Zosis geniculatus (Olivier)	Jy	O	S	R	S	